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SECOND SERIES VOL. VI, No. 8

BULLETIN

OF

THE NEW YORK ACADEMY OF MEDICINE

AUGUST, 1930

INCORPORATED 1851

PUBLISHED MONTHLY BY
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Entered as second-class matter, February 3, 1928, at the Post Office at New York, N. Y., under the Act of August 24, 1912.

Subscription $2.00 per year. Single copies, 25 cents.

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BULLETIN OF
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EDITORIAL

Newer Sidelights on the Antiquity and Provenance of Indian Medicine

Over against two imposing and venerable systems of ancient medicine—the Indian and the Chinese—question marks of considerable moment have been placed by modern scholars, queries respecting their origins, their uninterrupted development and the presumable extent of their antiquity. Thus, with reference to the proposition that China enjoyed an uninterrupted culture of 5000 years or more, Sudhoff sounds the challenge: "Really uninterrupted? Really uninfluenced? Two big queries which may be reinforced by a third: Is this cultural cycle after all so old?" "It must be admitted," he goes on to say, "that answers to all three questions are very dubious."

As to the antiquity and authentic character of Egyptian and Assyro-Babylonian medicine, there can be no manner of question. The papyri and the inscribed bricks not only tell their own honest story, but, in the case of the Egyptian medical documents, we are dealing with a late, decadent phase of culture, which seems actually to improve in quality as we go backward. The later Egyptian and Babylonian medicine which Herodotus described was the ultra-specialized, communal medicine which finds its analogues in our own time, and thus represents a comparatively recent development. The medicine of the papyric and cuneiform documents is the anonymous, collectivistic medicine of castes and guilds, which Sudhoff regards as pertaining to a very early and very low stage of development. Docu-

ments of this anonymous, overlaid, plagiarized quality are, in fact, very characteristic of the European medical literature, from the downfall of Rome to the invention of printing, a period of long painful gestation or re-birth, following the decadence and death of Graeco-Roman culture. Were the medical remains of Egypt and Babylon preceded, like those of mediæval Europe, by anything better? Given the slender shreds of evidence as yet available, our answers to these leading questions must remain vague and conjectural. In ancient Indian medicine, however, as exemplified in the Susruta and Charaka scriptures, we find a highly organized, highly specialized, highly rational body of medical doctrine, in quality equalled only by that of the Hippocratic Canon, and descended, as some proponents will have it, in a direct line from the Rig Veda and the Atharva Veda, (4000-1500 B. C.). But hear Sudhoff upon this matter:

"In the medicine of the Susruta, we encounter a highly organized system of scientific medicine as a tangible product of the Aryan intellect, comparable only with Greek medicine of the 5th century, B.C. As the first and oldest attempt to create an authentic science of medicine, it may well be assigned to the period of Vedic literature, yet is no more a product of it than was the medicine of Cos and Cnidos a creation of the priests of Asclepias. Hindu medicine, as we find it in the Atreya and Susruta, is like the Hippocratic medicine of Cos and Cnidos in one other respect, viz., both are associated with the tangible personalities of actual physicians, and are thus no longer the impersonal collective knowledge of guilds and castes, as was everything that preceded them. They have an individuality all their own. Behind them is sensed the great, thoughtful physician, who stamps them with the seal of his personality. The caste-lore of the Euphrates and the Nile, and to all appearance, of the Yangtse-Kiang and Hoang-Ho also, belongs in a much lower developmental stratum. The Atreya and Susruta stand upon a higher and more recent plane and presuppose the mental and observational activities of at least one or two thousand years preceding, even as the Hippocratic canon has for its long foreground the intellectual achievement of the Ionian nature-philosophers. In India, any significant advance over the Susruta is demonstrable only (to a very modest degree) in the work of Charaka, the contemporary of Galen. Susruta is, in round numbers, a hundred years older than Hippocrates, while Vagbhata, the latest of the compilers, belongs somewhere in the time of Paul of Ægina, which city was occupied by the Arabs, simultaneously with Alexandria,

[1] Sudhoff: *Essays* [etc.], New York, 1926, 85.

in 643 A.D. . . . It may be asserted that the stages Egypt-Babylon-China and India-(China?) Greece, comprise the total medical achievement of the whole world, in a scientific and historic sense. The notion of China as a totally independent culture must be checked with a large question-mark."

What are the characteristics of Vedic medicine, contained in scriptures of vast antiquity and attributed to Brahma himself? The Ayur Veda is said to have comprised eight parts or *tantras,* viz.,

1. Surgery (foreign bodies, instrumentation, bandaging, surgical diseases); 2. Treatment of diseases of parts above the clavicle; 3. General diseases (internal medicine); 4. Psychiatry (Demoniacal diseases); 5. Pediatrics; 6. Toxicology; 7. Rejuvenation by chemical remedies and preventive medicine; 8. Treatment of impotence or, as others have it, racial hygiene.

But beyond these divisions, the authorities are somewhat evasive; our medical knowledge of the great text is at an end, and we are referred, for further information, to its commentators (Susruta, Charaka). In the Rig Veda, the great folk-hymnal of the nomadic Aryans of Northwestern India, women are apotheosized and equated with man as "rulers of the household;" beef and beer (*madza,* mead) from the *soma* plant (the *haoma* of the Zendavesta) are the common articles of diet, and physicians are mentioned as healers of disease. The basic physiologic principle in the Rig Veda is fire from heaven (*agni*). *Agni* has its seat in the heart, from whence it controls the act of vision and is the essence of the act of generation. In contradistinction to this heavenly fire, there is an evil or demonic fire which is the activating principle of disease (fever). Of diseases in particular and of special therapy, there is no mention. *Agni* is all.[2] In other words, we are here in the presence of the most primitive phase of scientific thought, in which an idea, symbol or principle is first apprehended as a tangible thing. The tenth book of the Rig Veda contains innumerable versified charms and spells and about 1350 of these are carried over into the Atharva Veda, the medical con-

[2] R. Müller: *Janus,* Leyden, 1929, XXXIII, 349.

tent of which is entirely made up of them: charms for personal welfare and long life (a leading motive in the Rig Veda), for birth of male offspring, for easy delivery of the child, against worms, against jaundice, fever, demoniac possession, against snake-bite, against sexual impotence, and so on. And along with all this, imprecations and evil spells casting fell diseases, fatal wounds or death by snake-bite upon enemies. Here then, as in all the Vedas, we have the two initial phases of the most primitive type of medicine: the mass of the people as a credulous, superstitious child, with some faint signs of individualistic thought in the *agni* principle (animal heat). By comparison with the plain and sensible rules of personal hygiene in the more ancient Laws of Manu, there is nothing of consequence. As in all medical documents of great antiquity, the personal and public hygiene is better than the medicine.

What of Indian medicine as we find it in the two great texts on surgery and internal medicine, the *Susruta* and the *Charaka Samhita?* As we now know it, the Susruta, like the total Hippocratic Canon or the Salernitan Regimen in its final state, is an *édition definitive* of many vanished antipenultimate editions, the end result of a long process of fusion of tradition and novelty, with much interwoven and superadded material. On the strength of a reference in it to a single verse of the Atharva Veda (which may have been interpolated), it has been allocated by some enthusiasts to the period 4000-1500 B. C. which, as Sudhoff shrewdly observes, is like attributing the Hippocratic Canon to the priests of the Epidaurian temples. In its final state, the material is of rare but unequal quality. The anatomy, like all Oriental anatomy, is poor: 300 bones, 800 ligaments, 500 muscles, 300 veins; but as in the Smith Papyrus, there are a few good descriptions of individual bones. The physiology is aëro-humoral, based upon air, phlegm and bile and there is a minute Cnidian classification of diseases into 1120 varieties, each, as Neuburger says "a vague symptom-complex which, upon

the slightest deviation from its supposed norm, dissolves to reappear in a number of fresh categories." But the materia medica is singularly rich and valuable and the operative surgery, including the use of some 121 instruments with unique modes of instruction, represents the highest reach of the subject in antiquity. The general pediatric canon (infant hygiene) is certainly not surpassed by anything else of the kind in its period. In keeping with the terrain, there appears, for the first time, an exhaustive consideration of toxicology, including varieties of poisonous snakes, the effect of their venoms and the antidotes therefor. All in all, a singular mixture of superstition and common sense, traditional and superadded rational elements. Charms and superstitious practices go hand in hand with sensible rules and prescriptions, a purely conjectural list of innumerable, unimaginable parts of the body alongside of surgery of an advanced type, a Cnidian subdivision of multifarious diseases with a rich, multiform but fairly rationalized materia medica and therapeusis. Our well founded esteem for Indian medicine is based upon an assemblage of very real values, derived from the most scattered, and disparate sources, *viz.*,

A sensible scheme of vegetarian dietetics, bathing, clothing, respiratory gymnastics, domestic and personal hygiene and self-purification (*Laws of Manu*), analogous to the codes of tropical hygiene in the Old Testament or the Avesta and Vendidad of Persia; an exhaustive consideration of different fibres and materials for cleaning the teeth (*Institutes of Vishnu*); the employment of human inoculation against smallpox (*Sacteya*); the semeiology of cholera, dysentery, leprosy, malarial fever and diabetes (*Susruta, Charaka*); the localization of bubonic plague in rats (*Bhagavata Purana*); the knowledge of "honey-urine" in diabetes and of the purgative effect of honey (the "sugar diarrhœa" of Orgier) in newborn infants; a highly organized scheme of materia medica, operative surgery and infant hygiene; the use of mosquito-netting; knowledge of hypnotism and of the narcotic effects of hyoscyamus and *Cannabis indica;* knowledge of aphrodisiacs, poisons and venoms of poisonous snakes and their antidotes; mosquitoes as vectors of malarial fever (*Susruta*); the new feature of veterinary medicine.

Rudolf Hoernle assigns the Susruta to the 6th century, B. C. (a hundred years before Hippocrates), the Samhita of Charaka to the time of Galen (2nd century, B. C.) and

the Vaghabata to the time of Paul of Ægina (7th century, A. D.). To this arrangement, no exception need be taken if we assume the Susruta, as we now know it, to be the final state or end-result of some rudimentary ancestor dating back to the century before Hippocrates. As far as foreground is concerned, the initial or anterior phases of the Hippocratic Canon itself might well be assigned to the 6th century, B. C. But, in the light of recent research, the attribution of a remote antiquity to Indian medicine as presented in accessible texts, maintained, as it is, by so many enthusiasts,[3] may well give us pause, and for the following reasons.

About 557 B. C., Siddartha, whose family name was Gautama of the Sakya clan (Sakya Muni), was born at the foot of the Himalayas in northern Bengal and about 528 he deserted the pleasant ways of life and rode out into the moonlight to become the Buddha. But this great democratic religion could make no headway against the arrogance of Brahminism until after the invasion of Alexander the Great (326 B. C.), when the adventurer Chandragupta, who expelled the Macedonians and founded the Maurya dynasty (315), took it up as a weapon in his own conflict with the Brahmins. Through his son Bindasara (291-263), who conquered the Madras area, and his grandson, Asoka (263-221), whose conquests extended to Afghanistan, Buddhism spread all over India, and eventually reached China and Japan *viâ* Afghanistan and Turkestan. By the third Buddhist Council (242 B. C.), missionaries were sent out to Gandhara, near Peshawur in the Punjab (N. W. India), and there the Hellenic culture brought in by Alexander came into contact and ultimate fusion with the Northern Hindu culture. Not only was Greek art scattered all over Western Asia by the stranded minions of Alexander, so that we find Ganymedes in Gandhara and Thibet and Nike figures in Bustan and Kyzil, but the

[3] For example, in a recent article in the *Indian Med. Record*, Calcutta, 1929, XLIX, 289-299.

endless stone images of the Buddha, which now multiplied all over Asia, Ceylon, Japan and Java, are almost invariably of Hellenistic type, calm, immobilized, expressionless, of immortal repose and "unblamed serenity." The autochthonous or native art of India, on the other hand, is intensely modern in its passion for movement, realism, expressionism, eroticism, solidity of form in painting and leanings to the grotesque on occasion. Nothing could be less like the serene Graeco-Buddhist sculptures of Gandhara, Kutscha or Turfan than the voluptuous images on the Sanchi gates or the colorful erotic mural paintings in the Ajanta caves.[4] Between the two extremes are innumerable hybrids and subvarieties, common to the atlases of Griffiths, Foucher,[5] Le Coq and Grünwedel.

Now this fusion of Hellenic and Hindu art in the Punjab, in the 3rd century, B. C., is the virtual starting point of recent revaluations in the chronology of Indian medicine. To begin with the hospitals for men and animals which, it is said, King Asoka established everywhere during his beneficent reign, along with the planting of trees and gardens, and the sinking of wells. A recent exegesis of the second carved inscription of King Asoka and subsequent sources, by Dr. Reinhold Müller,[6] goes to show that our modern concept of the term "hospital" has been read into the various expressions employed, which are found to mean religious retreats, asylums or resting places, refectories or free hotels, medical-supply stations or storehouses for remedies (usually dietetic), designed by royalty for the innumerable strolling pilgrims of the Buddhistic cult, rather than as institutions for the reception, isolation, nursing and treatment of the sick and wounded alone. They were thus more nearly like the night-asylums of the Russians, the sanctuary retreats and charitable

[4] J. Griffiths: *The Paintings in the Buddhist Cave-Temples of Ajantâ* 2v. London, 1896.

[5] A. Foucher: *L'art gréco-bouddhique du Gandhara.* 2v. Paris, 1905-22.

[6] Müller: *Arch. f. Gesch. d. Med.,* Leipz., 1930, XXIII, 135—151.

food-kitchens of the Middle Ages or the subsequent granaries and storehouses against famine than the military hospitals of the Romans or the later hospitals of Christianity and Islam. Even the superstitious temple-cult of the Asclepieia of Cos, Cnidos, Epidauros and Pergamos, or the Isieia of Alexandria, was more exclusively medical in tendency, if not in character. The clientèle of these Buddhist retreats, moreover, comprised the whole vagrant swarm of pilgrims, monks, paupers, infirm or destitute women, children and old people and only incidentally the wandering sick or wounded. Such foundations, in fact, were merely designed for temporary use, in conformity with one of the fundamental tenets of authentic Buddhism, constant motion and migration of it votaries, except during unfavorable weather. They were charitable foundations of royalty and with their inception physicians themselves had nothing to do. True, the earlier xenodochia and nosocomia of Western Europe were hostelries and caravanseries of this type and Sudhoff's criterion of a hospital is the systematic treatment and cure of disease within its walls. But it seems hardly probable that this end was attained in India in the 3rd century, B. C. The nearest thing to it, in the citations sifted by Müller, is a recital by the Jainist monk, Jinakirti, in the 15th century, A. D.

Again, the coexistence in Rome of the superstitious Æsculapian cult (serpent-worship) with rational practice by Greek physicians points to many parallels, suggesting that Indian medicine probably travelled the same weary road of trial and error, of superstition set off by occasional common sense, which was the lot of European medicine during the selfsame stretches of time. The association of the serpent with supernatural powers, including the infliction, averting and healing of disease, is noticeable or, at least, inferential, in the case of certain carved caducei from the prehistoric caverns, the caduceus symbol on the steatite Babylonian vase in the Louvre (3000 B. C.) and its implications, the *uraeus* or cobra symbol surmounting the crest of the Egyptians gods, the seven-headed cobra

which forms the nimbus of the *nagas* or cobra-gods of India, the apparent cobra symbol on the Maya carvings, the Greek myth of the Gorgon head and the gigantic pythons on the votive tablets of Zeus Meilichios (the deified Æsculapius in serpent form). In Chinese and Japanese mythology, these serpents merge into dragons. The evolution of therapeutics, or even semeiology, from early common sense observations and experiments on dietetics (as elucidated in Hippocrates on Ancient Medicine) was common to Asia as well as Europe, and, as hinted by Müller, the materia medica and therapy of ancient India were mainly dietetic in the first instance, as in Greece. It is not unreasonable to infer, therefore, that the rational pediatrics and surgery of the Susruta was possibly an overlaid product of diffusion of culture, probably contemporaneous with the pediatrics of Soranus of Ephesus and the surgery in Celsus. If some of the extensive Indian materia medica was borrowed by Dioscorides and Pliny, it is equally probable that some of it may have been imported by travellers from Greece and Persia. In *Sino-Iranica* (Chicago, 1919), Berthold Laufer shows that a goodly number of Chinese plants, drugs, fruits, food-products, woods, minerals, precious stones and textiles were imported from Persia into China (the greatest botanic garden in the world) by the diffusional process. The excavations made by Le Coq and Grünwedel in Chinese Turkistan during 1902-14[7] reveal the pathway by which Graeco-Buddhistic sculpture, inferentially other phases of Hellenistic and Iranian culture, migrated into Mongolia, Thibet, China, Burma, Siam and Japan. The archæologic findings of the four Turfan expeditions cover four

[7] A. von Le Coq: *Die Buddhistische Spätantik in Mittelasien,* I-V fol. Berlin, 1922-4. A. Grünwedel: *Alt-Buddhistische Kultstätten in Chinesisch-Turkestan.* 8: Berlin, 1912. *Alt-Kutscha,* Berlin, 1920. *Buddhistische Kunst in Indien. 2.* Aufl. Berlin, 1920.

great back-and-forth migrations of culture between Asia and Europe, *viz.*,

1. A wandering of Scythian nomads from the west over Asia in pre-Christian times, usually over the grassy, well-watered plains north of Tienschow, where innumerable mortuary tumuli are found, surmounted by rude stone images of the *"baba yaga"* type existing in Southern Russia and the Crimea, and known by the same Turkish name (*kurgan*, fort). One detail of these South Russian sculptures, viz., a cord attached to the belt to keep the boots on straight, is also common to the blue-eyed, red-haired men of the mural paintings of Turfan. These Le Coq identifies with the Tocharians, an Indo-Germanic tribe of bowmen on horse-back, who conquered Western China as far as the Hoang-Ho in the 3rd century, B.C., but encountering the first westward Turco-Mongol migration, were defeated in a terrible battle about 176 B.C. and driven back westward to the Hellenistic areas of Northeastern Iranistan. This latter event corresponds with the historic irruption of Indo-Scythians into Persia and India (130 B.C.). Recent Russian excavations in Mongolia have unearthed Scythian (bronze-age) antiquities and Hellenistic textiles of similar provenance (2nd century, B.C.). Not only Greek and Persian, but even Egyptian and Mesopotamian cultural elements may have got into China through these northern migrations.

2. The conquest of Iran and the Punjab by Alexander the Great (326 B.C.) and its consequences, viz., inmixture of Hellenes and Macedonians with the native populations; foundations of the Graeco-Bactrian and Graeco-Parthian kingdoms; conquest of these areas by the Scythians or Tocharians (130-126 B.C.), who, as in Lapouge's law, were, in turn, assimilated to the Greek culture of the conquered peoples. In this way there came about a vast Hellenization of India and China, particularly by the spread of Buddhism over Asia *vid* Gandhara (242 B.C.-639 A.D.), where Hellenic and Indian culture collided and interfused.

3. The westward migrations of Huns, Goths, Visigoths and Vandals into Europe and the further interfusion of Eastern and Western culture by the spread of Islam and the Crusades.

4. The great Mongol invasions (1214-42), which extended as far westward as Liegnitz (Lower Silesia) and left indelible marks upon Eastern Europe and Russia, even to the faces of some of the population. The Mongols, Le Coq opines, may have brought into Europe the idea of printing with moveable types and certainly that of a postal service over vast distances by relaying of couriers and horses. This device, he says, brought China nearer to Europe than ever before, indeed, up to the advent of the Siberian Railroad and the aëroplane.[8]

The findings of the four expeditions are of exceptional

[8] A. von Le Coq: *Auf Hellas Spuren in Ostturkistan.* Leipzig, 1926.

interest and completely pulverize the notion that the unique cultures of India and China were isolated, independent developments.[9] In Eastern Turkestan, all the transition stages between temples of Hellenistic type and those of ultimately Chinese (pagoda) character are discoverable and kinship with the latter is seen in the mountain-like terraced plinths and Babel-like stupas of India. Le Coq even affirms that wherever an antique culture encounters a strange religion, it engenders a new kind of art. The survivals of Hellenistic art in Asia, most of them long buried under the accumulated dust of centuries, include:

1. Replicas of the Ganymede group of Leochares in India, Turkestan and Thibet, with change of the androgynous Ganymede figure into a woman. 2. Nike-figures in Egypt, India, Persia, Turkestan, China and Japan. 3. Changes of the antique Horn of Plenty (cornucopia) into a redundant blossom (Turkestan, China). 4. Thrones for the Buddha flanked by lions of Mycenæan type (India). 5. Helmets with animal heads on Bactrian coins and on Chinese and Japanese images. 6. Smoking lamps (Turkestan, Japan). Evidences of later transmissions and interchanges are: 1. The mediæval armor and costumes of the European age of chivalry on Tocharian men and women and identity of the slashed military jacket of the Sassanids with the Polish *ulanka,* which is not unlike the migration of Russian goloshes, the short skirts of European peasant women and the dances of the jungle to America. 2. Heavy cross-handled swords and peculiar helmets of crusaders in mural paintings of Kutscha. 3. Dragon-flags of Mongol type (Kutscha) in the Bayeux tapestry. 4. Coffins ornamented with heads and tails of dragons used for ancient Germanic warriors and for the Buddha (Kyzil).[10] In addition we need only mention the late Buddhistic character of early Florentine painting (immobilized Madonna) or that impressive passage from Huc's *Travels* in Tartary, Thibet and China, cited by Wells in his Outline of History: "The cross, the mitre, the dalmatica, the cope, which the Grand Lamas wear on their journeys, or, when they are performing some ceremony out of the temple; the service with double choirs, the psalmody, the exorcisms, the censer, suspended from five chains, which you can open or close at pleasure; the benedictions given by the Lamas by

[9] Let mention be made here of the highly original achievements of Hindu mathematicians, of whom the late Srinivasa Ramanujan was the subject of special enconium in *Proc. Roy. Soc. Lond.,* Ser. *A,* 1921, xcix, pp. XIII-XXIX.

[10] Le Coq: *op cit., passim.*

extending the right hand over the heads of the faithful; the chaplet, ecclesiastical celibacy, spiritual retirement, the worship of the saints, the fasts, the processions, the litanies, the holy water, all these are analogies between the Buddhists and ourselves." [11]

Controversy between protagonists of the convergence and convection (diffusion) theories of the origins of ethnic culture has been maintained with vigor since the first statement of the doctrine of spontaneous origins by Adolf Bastian (1881) and of the mechanical transmission of culture by Friedrich Ratzel (1882), and about all this hinges the question of the remote origin and independent development of Indian medicine. While it is plain that both have strong elements of truth and probability, it seems evident that certain basic or elementary ideas (*Elementargedanken*), concerned with the fundamental instincts of self-preservation and reproduction, have been common to the human species throughout space and without reference to time. We need only consider the immense importance attached to earth, air, fire and water, numbers, the stars and planets, the generative apparatus, the breath (*pneuma*), the blood and other humors of the body in all systems of ancient medicine. On the other hand, ethnic cults, practices and inventions are obviously spread by convection from country to country (jazz in Europe and the far East, kimonos and samovars in America) and illustrate Cardinal Newman's famous dictum that mankind at large are more apt to follow types and prevailing fashions than arguments and ideas. In our large cities, skyscrapers coexist with buildings that look like Greek temples and wherever a particular race is massed in sufficient numbers, its cult-practices obtain. Zoroaster, Buddha, Confucius, Thales and Pythagoras sprang into being along the 35th parallel of North latitude in about the same period of time (6th century, B. C.). Perhaps the solution of the whole matter is implicit in Huxley's observation

[11] Cited by H. G. Wells: *Outline of History*. London. I, 267.

that this very period was activated by "some powerful mental ferment over the whole of the area comprised between the Ægean and Northern Hindustan," one of the most brilliant guesses that Huxley ever made, and pointing to remoter origins of all these cultures in Egypt and Babylon.

F. H. GARRISON

THE NONVALVULAR DISEASES OF THE HEART IN MIDDLE LIFE

DAVID RIESMAN,

Professor of Clinical Medicine,
University of Pennsylvania, Philadelphia.

Delivered, January 17, 1930, in the Friday Afternoon Lecture Series of The New York Academy of Medicine.

Until a few years ago tuberculosis headed the list of causes of death but persistent education of the people, a better economic life, and probably other factors, have reduced the mortality to half or even less. In Philadelphia for example the death rate from tuberculosis was:

In 1909	187.3	per 100,000 population.
In 1919	142.7	per 100,000 "
In 1929	69.34	per 100,000 "

The questionable honor of standing at the head of the list now belongs to heart disease. In every large city of the country the death rate from this cause is rising both relatively and absolutely so that to-day heart disease is apparently firmly emplaced as the leading cause of death. Reports for 1928 from certain states with an aggregate population of about 25,000,000 show that 228 persons out of every 100,000 died from heart disease as compared with 106 from kidney disease, 105 from cancer, and 100 from pneumonia.

For Philadelphia the death rate from heart disease was:

In 1900	128	per 100,000 population.
In 1909	167.8	per 100,000 "
In 1919	190.4	per 100,000 "
In 1929	211.14	per 100,000 "

In the year 1926 it reached the extraordinary figure of 295.7.

In the age period from 40 to 50 the figures were:

For 1909	321 per 100,000	population.
For 1919	393 per 100,000	"
For 1929	441 per 100,000	"

And from 50 to 60:

In 1909	441 per 100,000	population.
In 1919	601 per 100,000	"
In 1929	823 per 100,000	"

The recently published statistics of the Metropolitan Life Insurance Company likewise prove the growing menace of death from heart disease especially in the adult periods of life.

All these figures must fall far short of the real facts for they take no account of the many deaths in pneumonia, diphtheria, and after operations that are actually due to failure of the heart but are recorded as deaths from the more obvious cause. We must of course not carry the argument too far for in the last analysis everybody dies because the heart stops. I am referring only to those cases in which death was due to the failure of a heart worn out before its time.

It is true that some disease must be first as the cause of death but suppose it were typhoid fever or malaria or hookworm. We as a profession should feel distressed and ashamed since there are available methods of controlling these diseases and there could be no excuses for failing to put these methods into practice. What about heart disease? Unfortunately the problem here is incomparably more difficult. The causes are manifold, and often entirely elude us, and without a knowledge of causes no problem can be successfully attacked. However I see light dawning in two directions—in the direction of rheumatic fever and in that of syphilis.

It is difficult to determine the quantitative value of the syphilitic factor but certainly among the adult male population infected with lues a large number die of heart dis-

ease in the prime of life. Of rheumatic fever and its variants including chorea we know much more, largely through the work of St. Lawrence, Swift, and others, for it takes its toll in childhood and adolescence, a section of the population that can be investigated and studied during school life.

It has been shown that the incidence of certain infections and rheumatic diseases in association with damaged hearts is very high—scarlet fever in 12 per cent., diphtheria in 16 per cent., chorea in 15 per cent., rheumatism in 44 per cent., and tonsillitis in 66 per cent. of the cases.

That much can be done in preventing rheumatic heart disease is indisputable—any lagging in our efforts is due to the fact that the profession as a whole is not sufficiently aware of the importance of rheumatism in the causation of heart disease and of the means of combatting it. Systematic health examinations, removal of diseased tonsils, improvement in domiciliary and community hygiene, regulation of diet go far toward lessening the ravages of this disease. Only recently I showed to my students a girl of 13 of Italian parentage who had advanced aortic and mitral valve disease of rheumatic origin. The child had obviously diseased tonsils and enlarged lymph glands in the neck. The students asked me whether I advised removal of the tonsils. My reply was that while it was like shutting the stable door after the horse was stolen, inasmuch as the large glands in the neck were indicative of continuing infection, I should advise tonsillectomy. The operation was done under general anesthesia and passed off without difficulty.

Early diagnosis by the physician of the existence of some form of rheumatic infection is of great importance in prevention. Perhaps we shall still further minimize the danger of rheumatic fever, a truly terrible specter of childhood, by specific vaccines and by better understanding of the predisposing causes. This whole subject is a big and worthwhile field for the sanitarian and the family doctor.

But there are other forms of heart disease—and when I use the term heart disease I really mean diseases of the circulation—of the causes of which we have little definite knowledge, and the symptoms of which are often so insidious that when we come to recognize their meaning, it may be too late to do much good.

I want to speak especially about those more obscure forms of heart disease that are not due to rheumatism or to syphilis, for not only are they very common but they are the ones that are chiefly to blame for the heart failure in middle life.

Perhaps at this point some of the older persons present might ask what I mean by middle life. When I was a student in the medical school my professors, some scarce 40 years of age, looked to me as old and venerable men. Such is perennially the view of youth. This was brought home to me in an uncomfortable way a short time ago. A student presenting a case before my class began, "Mr. X is a middle-aged man of 40." My heart sank within me. Does middle life begin at 40 or at 50 or, as I like to think, at 55 or 60, partly with reference to the fact that the average span of life has been prolonged to about the age of 56? Women surely are pushing the date farther and farther onward—in dress, in general activity, even in the onset of the menopause. The women of to-day at 50 are much younger than their mothers were at the same period. Perhaps instead of taking a particular year, middle life should be dated from a time when a change in function manifests itself from which a beginning wearing down of the machinery can be definitely inferred. Middle life is thus rather a physiologic than chronologic period.

The disease of the heart responsible for so many cases of physical breakdown in the period of active life rarely affects the valves—it is as Christian has well called it nonvalvular disease. The causes are obscure. They can only be discovered if we make it a practice to take a searching

history in every case of disease that comes to our ken. Such a history combined with the proper clinical and if the opportunity offers pathologic study will eventually yield the needed thread of Ariadne. Not only is the history at the moment important but also the Mackenzian method of continuous record of all morbid conditions even the most trivial.

On the basis of our present knowledge the following statements may be made:

1. A certain proportion of cases is due to latent syphilis. Until recently it was generally held that lues attacks the aortic valves and the aorta chiefly but the studies of Warthin show that syphilis may attack the heart wall and that it may be responsible for sudden death which without a careful investigation might be attributed to a coronary accident.

2. Chronic focal infection is in all probability responsible for many cases of myocardial disease. At times the evidence is clear and incontrovertible, at others it is only presumptive, and in still others there is nothing to support it but dangerous analogy. The Germans have been more or less unwilling to accept the American, I ought to say perhaps, the Chicago-Rochester point of view but they have not offered us a countervailing theory. Personally, I am a follower of Billings and at a somewhat greater distance of Rosenow of the Mayo Clinic.

As a Philadelphian it is but fair that I should make it known to any that may be unaware of it that Benjamin Rush had a very good idea of the importance of focal infection. In one of his letters, dated I think 1803, he speaks of the possible systemic diseases resulting from abscesses of the teeth, and even Rush had a precursor in the great French surgeon Pettit.

The focal infection can be in any one of the familiar places but I should like especially to indict the gall bladder. I have seen several instances in which cardiac symp-

toms of great severity were entirely abolished by removal of a diseased stone-bearing gall bladder.

Sometimes the physician is afraid to operate in such cases considering the myocardial disease a positive contra-indication. I am inclined to think that if the patient is otherwise a reasonably good risk then the cardiac disease is not a contra-indication but the very opposite, an indication to remove the gall bladder.

The tonsils, the teeth, the sinuses, the genito-urinary tract are also more or less important as possible foci of infection. From time to time I have wondered whether fibroid tumors per se can cause myocardial disease. Lynch in a recent number of the *Journal of the American Medical Association* expressed the opinion that they by themselves are not responsible for myocardial disease.

Is failure to obtain improvement by removal of an infected focus proof of its non-importance? I hardly think so. A few days ago the ceiling in my sitting room was ruined by an over-flow of water in the bathroom above. After the plumber has repaired the defect in the bathroom the ceiling damage still remains but it may not get worse.

3. Infectious diseases whether in childhood or later may lay the foundation for subsequent myocardial or coronary disease. I have wondered whether the apparent increase in coronary disease might not hark back to the influenza epidemics of recent years.

4. But there are other factors beside focal infection that have to be considered—those indefinable conditions that cause what Clifford Allbutt designated as Hyperpiesia. Overeating is one of them. It is curious how many persons scout the idea that they eat too much. "Why doctor, I hardly take anything for breakfast and my lunch consists of a sandwich and a glass of milk." When one goes into detail one finds that the evening meal is easily equivalent to two square meals, in fact it may be two meals squared.

5. What part if any the lack of vitamines or their improper balance may play in the production of degenerative diseases is altogether a terra incognita.

6. Tobacco when used in excess is to my mind a cardiac poison. While it may not always act in that manner, I am quite convinced that in patients who have had cardiac attacks, especially of coronary or anginal type, it acts as a harmful agent. Alcohol is less important; I doubt if by itself when taken in moderation, it produces the myocardial degeneration of middle life.

7. But more important than any of the causes named are the general mode and habits of life. Overweaning ambition with all it implies in striving and neglect of self is an outstanding factor in the history of an ever-increasing number. In our own profession the ambition may reveal itself only as an excessive devotion to duty or it may be combined with a desire to provide well for the family. In any event it leads to irregularity of meals, to inadequate sleep, not rarely to a passionate affection for My Lady Nicotine.

Since the various exciting causes I have enumerated are operative upon a large part of our adult population in the mid-period of life, the question arises why do they not all succumb to myocardial or cardiovascular disease? The answer is to be found in the word heredity. The medical pendulum swings back and forth in long sweeps—for several decades it hovered around environment but now it is slowly swinging back toward the constitution which implies the hereditary factors. The constitutional aspect of disease is certainly important but the subject is not one upon which I want to dilate at the present time. Suffice it to say that the majority of chronic diseases arise upon a prepared basis which explains why many of these diseases are familial. In the case of myocardial disease the familial tendency need not express itself in identical ways in all the members of a given family. Apoplexy may kill one, angina pectoris or coronary occlusion another, myo-

cardial disease a third, arterio-sclerotic nephritis a fourth. Though seemingly different there is a unifying factor in all of them which is evidently readily transmitted by heredity.

I have just said that the constitutional factor is important in chronic diseases. There are many reasons for believing that it is equally important in acute infectious diseases. I well remember two families of my acquaintance living in the same section of Philadelphia during the typhoid era in the city. In the one family there were a number of cases of typhoid fever, some seemingly had a second attack. In the other there was not a single case of typhoid fever although they like the other family drank the same contaminated water. It is but the old idea of the soil.

Emphysema is very apt to lead to an eventual weakening of the myocardium with all the attendant signs and symptoms of congestive heart failure.

The goiter heart stands in a class by itself. I need not say much about it except to call attention to one fact pointed out by Lahey of Boston and others that sometimes the goiter condition is not very evident, and the real cause of the myocardial disease and of its failure to respond to the usual treatment is overlooked. Hence the advisability in certain obscure cases of myocardial failure of making a basal metabolism test.

I need not dwell long on the pathology of "medieval" myocardial failure. We usually find cardiac hypertrophy with degenerative changes, with fibrosis, scars from infarcts, etc. Often but not always the coronary arteries are diseased; sometimes the kidney or the brain exhibits arterial disease. The vessels of the eyes may or may not show sclerotic changes but whether healthy or not one cannot with certainty assume a corresponding condition of the cerebral vessels.

As I have said before the valves may not show any note-

worthy lesions although patches of sclerosis and dilatation of the mitral ring are not infrequent.

Symptomatology:

I have classified the early manifestations of myocardial weakness under four heads:—

I. The respiratory.
II. The digestive.
III. The painful.
IV. The oppressive.

I. The respiratory is the most common type and shows itself usually as a shortness of breath on effort, not rarely as a sudden paroxysm of air hunger coming on especially at night. There is a tendency on the part of the patient, sometimes on the part of the physician, to attribute the shortness of breath to lack of exercise, to obesity, or to indigestion, the last usually in those patients that complain much of gaseous distention. One should never make such a diagnosis in a man or woman of 50 years and over without a very careful consideration of the state of the heart and circulation.

Sometimes the myocardial patient has a racking cough quite out of proportion to the signs found in the lungs. In such patients the diagnosis of chronic bronchial asthma may be or even of whooping-cough is erroneously made.

II. The digestive type. This is one of the most important not so much because of its frequency as because of the possible grave errors in diagnosis. I have elsewhere called attention to the gastric masquerades of myocardial disease (*Journal of the American Medical Association,* November 17, 1928, Volume 91, 1521). In the milder cases gaseous distention and belching are the principal complaints. It is easy to see why such symptoms in the absence of striking cardiac changes on auscultation should lead to a diagnosis of gastritis or of nervous dyspepsia.

In the severer cases, as for example in coronary occlusion, the symptoms are frequently those of an acute ab-

dominal explosion, suggesting perforation of an ulcer or gall-stone colic. Even angina pectoris may give rise to symptoms difficult to distinguish from biliary attacks.

III. The painful type. The location of the pain, its intensity, the well-known angor animi are suggestive of cardiac disease. However, as I have just said, the pain may be referred to the epigastrium or to the right upper quadrant and thus simulate gastric, duodenal, or gall-bladder disease. Under the painful type I would include both angina pectoris and coronary thrombosis, the latter a disease of increasing frequency. Perhaps the increase in frequency is only apparent and is due to a better knowledge of the earmarks of the disease.

While speaking of the painful type I want to call attention to an important but neglected phase of the subject, namely this, while the pain may be the first thing to attract attention to the heart it can scarcely be looked upon as the beginning of disease. There must of necessity be a more or less prolonged incubative period, the early detection of which should be our aim. By following Sir James Mackenzie's advice already mentioned of studying and recording the beginnings of disease, by making careful routine physical examinations, and by using the electrocardiograph frequently, it may be possible to discover latent defects at a time when arrest of the disease is most easily achieved. I am quite certain that if we search carefully the history of cases of angina pectoris and of coronary occlusion we shall find that the patient has had attacks of oppression or of indigestion like those I have described. Such attacks often make no impression or if they do are thought not to be related to the heart.

IV. The oppressive type. It is a debatable question whether this constitutes a separate type. My justification for separating it from the others is that I have seen a goodly number of patients whose cases could not be otherwise classified. In a typical instance the patient complains that on walking he has a sense of oppression across the

upper or middle chest. On stopping for a moment the oppression passes off without any eructation of gas or any other symptoms referable to the stomach. The attack is most likely to come on if he starts walking directly after a meal or walks uphill against a strong wind. Though the trouble appears to be mild it yet involves the possibility of sudden death. English writers have called it angina sine dolore but there is no true angor animi nor is there in the early stages of the condition any radiation to the arms. Later on there may be such radiation but like the thoracic distress it is of a mild character.

Sudden death can occur in any of the four types of myocardial disease—I am speaking of their early manifestations—but it is least likely to occur in cases in which the respiratory symptoms dominate the picture.

The sudden death is often attributed to indigestion especially in the newspapers and the statement is not infrequently made that the patient had not complained of heart trouble before. It is my belief that with rare exceptions the patients had symptoms prior to the final catastrophe but that the symptoms were of the type I have described, the oppressive or the gastric, the true significance of which was not appreciated by the patient nor perhaps by the doctor if he consulted one.

It is for this reason that I want to call special attention to these early signs, gastric distress, mild attacks of pain, and a sense of oppression on effort. If these signs are properly understood not only will fewer persons die a journalistic death of acute indigestion but preventive treatment can be instituted at an earlier date.

Other symptoms of myocardial disease frequently overlooked are emaciation and subnormal temperature. The patient shows this emaciation most markedly about the neck so that the neck becomes scrawny and the collar stands out. There is also a tendency to fatigue and a general lack of both mental and physical endurance. Not rarely these symptoms are associated with a change in

temperament, the patient becoming irritable and morose.

Diagnosis: From what I have said before it is evident that myocardial disease is an insidious thing and that our efforts should be bent upon discovering it, as it were, in the making. The text books usually describe a fully developed disease with congestive heart failure, etc.

The following objective criteria are helpful in the diagnosis of myocardial disease: Perhaps the commonest is an increase in the size of the heart. This can be easily determined in a majority of instances by inspection and palpation, especially the latter. The physician must, however, make it a practice to place the hand back into the axillary space as the apex beat is sometimes far out even though an impulse can be felt in the normal situation.

The X-ray is naturally useful when the size of the heart is in doubt.

Auscultation quite often leaves us in the lurch for the reason that in the majority of cases of myocardial disease in middle life there is no murmur, and for many physicians the absence of a murmur when the rhythm is regular spells a normal heart. One of the best lessons I have had enforced upon me in my service in a large municipal hospital has been the frequency with which even in advanced cases of myocardial disease with congestive heart failure a murmur is absent. That this is true of angina pectoris cases is too well-known to need emphasis. Unless a patient has had rheumatic fever or syphilis we need not expect to find a murmur. Murmurs may be present but they are not of real significance as far as the diagnosis is concerned.

While a normal rhythm and reasonably good heart sounds may exist despite the presence of myocardial disease, quite frequently there is a change both in rhythm and in quality of the sounds. A common change in the former is the occurrence of a gallop rhythm—a gallop rhythm of the anapest type which gives to the ear the impression of a reduplication of the first heart sound. At

times there is arrhythmia, extrasystolic or fibrillary, the former being more common. As a rule such extrasystoles are not very significant as they may disappear with a little rest or on the removal of some focus of infection or after regulating the diet so as to lessen gas formation. In other words one would not conclude from the presence of extrasystolic arrhythmia alone that there was organic myocardial disease.

The heart sounds themselves may undergo a change in quality which is rather subtle and can be depended upon only in marked cases. The principal change is a softening or muffling of the first sound at the apex or of all the sounds at all the valve points. The lungs may show basal râles or small pleural effusion.

Blood Pressure: There is no characteristic blood pressure in the myocardial disease of middle life. Perhaps in the majority of cases it is elevated, in some it is normal, in others it is low. A precipitous fall is found very generally in coronary thrombosis. A considerable fall in an individual who has no pain, but has had the digestive or oppressive type of symptoms, is a sign of grave significance.

The *electrocardiograph* is a valuable instrument in revealing the existence of myocardial disease. It may merely confirm what clinical investigation has already revealed but there are border line cases in which the instrument is exceedingly helpful. It must, however, be remembered that the electrocardiogram is sometimes normal despite the presence of serious myocardial disease; in such cases clinical intuition is the better guide.

Treatment: Myocardial disease of middle life being an insidious degenerative process our objective as physicians should be primarily to find out what brings about or initiates the degeneration. This as I have indicated is difficult but can perhaps be accomplished in time if during our health examinations we are thorough and keep careful records. Eventually, though perhaps not for several gener-

ations, the professional mind may recognize the earliest signs of these degenerative processes and then medical men, our successors, will be able to institute prophylactic treatment in good time.

Whether eugenic principles will ever sufficiently influence sexual selection in man to favor a totally untainted off-spring is a question that cannot be discussed with any profit at this time.

For the present we shall have to content ourselves with instituting whatever protective measures are feasible and reasonable when the disease is established and to treat symptoms as and when they arise. It is wise to take account of the family history however, and if it indicates any weakness of the heart or circulation an attempt should be made to regulate the man's or woman's life in such a way as to conserve the integrity of the cardiovascular system.

Search should be made for foci of infection and the removal attempted if it does not entail any undue risk and if it is possible to show a reasonable connection between the infection and the cardiovascular malady. The importance of periodic examinations in persons who have shown evidences of disease of the heart must be emphasized so that the man or woman will submit to a periodic overhauling even if there are no warning symptoms. As guardians of the public's health it is our duty to impress upon the people the wisdom of spending money for such an examination.

Actual Treatment: In all of the four types of myocardial disease a period of rest is advisable, in fact usually imperative.

In the case of coronary disease four weeks is the irreducible minimum for this period of rest. The rest must not only be physical but must also be mental.

With respect to diet no hard and fast rules can or should be laid down. It is of importance to make the meals small

and simple, especially the evening meal. In general the kind of food is a matter of less moment. However, pastry, fried foods, fresh breads, condiments, tea and coffee should be avoided.

One of the great annoyances of patients with cardiovascular disease is gas. While this often is swallowed air, it may be in part or sometimes wholly due to fermentation. It is therefore desirable to avoid such food as might create gas. I have found that there was at times more gaseous distention after fluids than after solid or semisolid foods; I therefore limit my patients to about 1200 cc. of liquid which includes water, milk, broth, fruit juices, all reckoned as liquids.

There are cases that do well if put on a milk or butter or acidophilus milk diet for a few days. In some instances I make one day a week a butter milk day. On such a day the patient takes a glass of butter milk every three hours with as much orange juice between the milk feedings as he wants.

For several years I have had the notion that carbohydrates in the form of sugar or glucose were beneficial to myocardial cases. For this reason I use a good deal of water ice, apple sauce, and dry non-milk chocolate, also glucose by proctoclysis, if need be.

For patients who have bad taste in the mouth and a dry tongue I order the chewing of gum, a habit for which in health I have only contempt.

If the gas is not controlled by diet an enema with or without milk of asafetida will usually give relief—if not hot wet compresses, flax seed poultices, turpentine stupes, a rectal tube, and finally pituitrin are measures to be employed.

I have said nothing so far about the use of tobacco. I am perhaps a little extreme on this point but my practice is to prohibit smoking or to permit it only in greatest

moderation in the case of patients with myocardial disease.

I shall not go into details of the medicinal treatment in this article. Only a word about digitalis—if there are signs of congestive failure or of auricular fibrillation digitalis is the supreme agent. Its methods of administration are too well-known to be discussed here. Suffice it to say that in the ordinary type small doses are adequate.

A word about calcium. In certain types of myocardial disease even in the painful forms calcium salts frequently act beneficially though it may not be possible to explain this action on pharmacologic grounds. I employ calcium lactate in doses of 6 decigrams in capsule or a tablet or powder of calcium gluconate, 3 times a day.

Psychotherapy: In the patient with real heart disease as well as in him who imagines he has heart trouble—the cardiophobe—encouragement is of the greatest importance. A word of cheer will often make the patient sleep better, eat better, and accomplish more than drugs.

Treatment at Spas: The Nauheim treatment either in its native heath or in certain places, Watkins, N. Y., Hot Springs, Va., White Sulphur Springs, W. Va., often brings about considerable improvement in cases that are not too far advanced. The good results do not depend entirely upon the water but in large measure on the general regime and on the freedom from the daily cares of life that distance brings.

Exercise: When should the patient resume exercise and what exercise should he take? Many of the middle-aged adults who make up the largest proportion of cases in which we see the early signs of cardiac failure are more or less given to golf. I believe many overdo this sport—the call of which for them seems almost irresistible.

Only after the patient has been tested out by having him walk on the level and he is found not to have an undue acceleration of the pulse, undue fatigue, or breathlessness

may he be allowed to play a little golf and then only on an easy course and not to exceed a few holes. In an interesting article in a recent number of the *Journal of the American Medical Association,* (May 4, 1929, page 1522) the editorial writer quotes Kaprovich who points out how much energy an individual expends in walking at the rate of four miles an hour over a conventional level course of 6000 yards:—as much as he would in lifting himself five times to the height of the highest skyscraper in New York. At the speed of two miles an hour he would expend as much energy as would serve to lift him a little over four times the height of the same building and since the golf courses are located on hilly grounds the output of the energy to cover the necessary playing distance is greatly increased. To all of this the work involved in practice and actual shots and in searching for the ball must be added. The writer quaintly adds, "And when it comes to searching for lost balls is all the difference."

One word more—the middle-life patient with early myocardial disease who has an intelligent doctor and cooperates with him, has an excellent chance of dying an old man.

REPORT ON THE SPAS OF EUROPE

E. H. L. Corwin

At the request of Mr. Bernard M. Baruch, Chairman of the Saratoga Springs Commission, Dr. John A. Hartwell, President of The New York Academy of Medicine, requested the following physicians to undertake a study of the Spas of Europe for the benefit of the Saratoga Springs Commission: Malcolm Goodridge, M.D., Chairman; L. W. Gorham, M.D., Milton B. Rosenbluth, M.D., and John Wyckoff, M.D. Dr. E. H. L. Corwin was asked to serve as secretary. The purpose of this study was to inquire into the organization and administration of the spas, the methods as well as the efficacy of the spa treatment; and to advise whether some of the principles underlying the administration of the "villes d'eau" could be applied to the development of our own resources.

The places visited comprised some of the renowned "cure resorts" of Austria, Czechoslovakia, England, France, Germany, and Hungary. The particular spas were chosen because of their reputed medical importance, their organization, and the differences in ownership control. One of the spas visited is owned and operated by the state, some are owned by the state and exploited by private leasing concerns, others are privately owned and managed without any supervision on the part of the state or any other agency, and still others are owned and operated by their respective municipalities. The members of the Committee visited, either jointly or severally, Bad Gastein and Baden bei Wien in Austria; Karlsbad, Marienbad, and Franzensbad in Czechoslovakia; Harrogate and Bath in England; Vichy, Aix-les-Bains, Royat, Chatel-Guyon, Plombières, Vittel, and Contrexéville in France; Nauheim, Wiesbaden, Kissingen and Bad Brückenau in Germany; and Budapest in Hungary.

It goes without saying that the inquiry relating to proofs of medical efficacy of the spas could not be dealt with at all adequately in the month of time that the Com-

mittee had at its disposal in Europe. In all places visited, the outstanding medical men gave the members of the Committee the benefit of their personal clinical observations, and of such laboratory research studies as had been made. In addition, the members of the Committee interviewed several outstanding clinicians who had no direct relationship with any of the health resorts. The Committee was fortunate in hearing the views of Professor Paul Haertl, the Scientific Director of the Bavarian Spas; Professor Zörkendörfer of the University of Prague; Professor Boehm of the University of Munich; Professors Vámossy and Dalmady of the University of Budapest, as well as Dr. Aladár von Soós; Professor Poupelain of the University of Bordeaux; Dr. O. Baudisch, a recognized authority in the modern methods of chemical analysis of mineral waters, and many others. To all of the gentlemen, the Committee owes a debt of gratitude for the time they placed at its disposal, sometimes at great personal inconvenience, and for the numerous courtesies extended.

The "Atmosphere" of the Spas

The spas of Europe have a long tradition, dating back in many of their present aspects to the days of the Romans. In some of the baths the pipes laid two thousand years ago or more are still in actual use. Emperors and kings have lavished their bounty on the development of the spas. The communities in which they are located regard them as valuable economic assets and in most places their upkeep is beyond reproach. Hither, hundreds of thousands of people come annually from all parts of the world in search of health and rejuvenation. In the years following the War, the attendance declined, but during the past season it again reached the pre-war level and in some places even surpassed it. The obvious reason for the veritable pilgrimages to the spas is that the sufferers from chronic ailments receive there attention which it is difficult or impossible to receive at their respective homes. Then, there is also the invincible belief in the magic powers of the "min-

eral waters." This psychic phenomenon is carefully nurtured by the well organized spa propaganda. Faith in the efficacy of the waters permeates the entire atmosphere and is shared in alike by the hotel keepers, tradespeople, bath attendants, rich and poor patients, and the local practitioners. It creates an atmosphere highly conducive to the care of the sick, which is a decided asset in the treatment of many types of ailments.

The physical environment adds to the maintenance of this attitude on the part of the patients, as well as to their comfort. The springs are encased in buildings which often have the appearance of shrines. The patients are impressed with the potency of the waters and are warned against the use of them, either internally or externally, except as ordered by the physicians. The prescribed diet must be rigidly followed, as must be the regulations for rest and exercise. The hotels and restaurant keepers cooperate with the management of the spas in providing certain required facilities for the guests, and in serving meals particularly adapted to the requirements of the sick.

In many of the places there are private sanatoria, usually under the management of physician-proprietors, where the patients remain under the complete supervision of the establishment during their stay at the spa. Arrangements are often found whereby mineral water baths can be taken at the hotels or sanatoria.

Except in the French resorts, gambling establishments are generally proscribed. Everywhere, walks are laid out in the parks where are also located the casinos, tea rooms, covered promenades, open air orchestras, and other diversions, as well as opportunities for social gatherings.

Although some of the spas are located amid natural scenic beauty and enjoy a good summer climate, very many do not have this added advantage. At some of the resorts the summers are hot and humid, or rainy, and in others the surrounding country is flat and uninviting. Everywhere, however, provision is made for inexpensive excursions,

motor drives to places of beauty or historic interest, horseback riding, golf, tennis, and similar recreations.

Although in most of the spas the season lasts during several months of the year, there are certain spas which are used throughout the year. The attendance, however, is greatest during the period corresponding to the usual summer vacations. Very often the course of treatment at a spa is followed by a period of "after cure." Patients are advised to go to the mountains or to the seashore for a period of recuperation. This habit on the part of very many people to visit some health resort during the summer, provides not only an opportunity for restorative, but also for preventive treatment. Their condition is checked up annually and for at least a certain period during the year they lead a soundly regulated life.

The Problem of "the Chronic"

There is probably no other civilized country in the world where those afflicted with chronic maladies receive less consideration than in our country. This can hardly be gainsaid. The problem of "the chronic" has been an open challenge to the American medical profession for a long period. Very little, however, has been done to meet it. Physicians are naturally more interested in and more concerned about the acute manifestations of disease than they are in its chronic stages. And yet, to the afflicted individual, it is a matter of great concern; for the affliction, whether it be of renal, cardiac, digestive, neuro-psychic, or "rheumatic" character, interferes with his efficiency as a breadwinner and as a member of society. The problem of chronic disease is an important social problem which the medical profession will some day be forced to realize and meet in an adequate manner.

There is no doubt that the failure on the part of the medical profession at large to employ all the means at its disposal to deal with chronic disease has been responsible for the growth of cults. The relief which many patients

receive from the administration of the various kinds of physical and psychic therapy practiced by the exponents of these cults, has resulted in the development of spurious practices which often are as injurious to the individual and inimical to the public health, as they are lucrative to the charlatans. It is because of the concern in the problem of the care of the chronically afflicted that the undersigned accepted the commission to visit and study the spas of Europe.

The Recognition of Balneology

In Europe, the public has forced the hand of the medical profession with regard to the spas. Multitudes go every year to the "Heilquellen" and return seemingly much benefited. Many patients make it a practice to go to a selected health resort from year to year, over long periods of time; others try different spas each year, some taking more than one "cure" in a season. Many physicians, including the leaders of the medical sciences at the universities and their families, take the treatments themselves. In many of the important medical schools, balneology is taught either as a part of therapeutics or pharmacology, or as a special elective subject. The students are given an opportunity to visit the spas, the state making contributions toward their maintenance during the visits, and the railways giving reduced or free fares. In almost every one of the important spas, conferences are held each year to which physicians are invited, and at which the therapeutic effects of the waters on various diseases are discussed at length. Very often, men of note present papers, and the proceedings are reported in the medical press of the particular country, or published in separate volumes. In almost every country there exists a national balneological society, and the International Balneological Association holds its conventions annually. Mineral springs are found in virtually every country and most of the countries of Europe have established, under government auspices, Institutes of Balneology or Hydrology where studies of the physical

and chemical properties of the mineral waters are made, and data compiled thereon.

Administrative Control

The state or provincial governments exercise supervision over the spas. In France, the government maintains an inspector at every resort, whose salary is paid by the company leasing the spa from the government, except at Aix-les-Bains, which is operated by the state itself, or at resorts owned privately, like Vittel. In Austria, the provincial governments maintain technically trained supervisors whose duty it is to safeguard the supply of the waters and to advise on engineering and cognate problems, although the springs, as a rule, are the property of the municipality in which they are located. The same applies to Czechoslovakia where the springs, except some at Marienbad, likewise belong to the municipalities. In Marienbad, a suit of many years standing is in progress between the town and the monastery relative to control over the springs. In Bavaria, the government maintains an expert staff to plan the development and supervise the exploitation of all the medicinal water resources of the realm, as well as to render technical advice in the heating of the waters, the preparation of fango, and like problems. In Great Britain, the principal thermal stations have formed the British Spa Federation.

With the exception, perhaps, of Aix-les-Bains which is managed directly by the state, the revenues derived from the spas more than cover expenditures. This favorable balance is very often due to profits from the extensive sales of the mineral waters and salts. Some of the well-known spas, like Vichy, Karlsbad, Neuenahr, Ems, Vittel, Evian, and others sell millions of bottles annually. The bottling works are operated by the municipalities owning the springs, or by the same concessionaire companies which are managing the particular spas.

The Wide Range of Spa Treatment

The number and variety of conditions for which the waters of each spa are employed therapeutically are imposing, due not only to the diversity of the chemical contents of its many springs of different pharmacological potency, but also due to the differences in the thermality of the waters and in other properties peculiar to each spring. The healing qualities claimed for each spa invariably comprise a very long array of unrelated conditions, and the contra-indications mentioned are usually very few. The perplexing aspect of the science of balneology is that waters of different chemistry and thermality are often considered suitable for the treatment of the very same pathological conditions. In the achievement of the results there are evidently influences at play which supplement the purely pharmacological and thermal qualities of the waters. Although the spas, as a rule, make a universal appeal, their renown rests, nevertheless, on their peculiar efficacy in certain major conditions. Nauheim and Royat, for example, are recognized as the stations, par excellence, for the treatment of cardio-vascular affections; Karlsbad, Marienbad, and Vichy for metabolic, gastro-intestinal, and hepatic disorders; related to these are Harrogate, Kissingen and Homburg. Then Aix-les-Bains, Wiesbaden, Salso Maggiore, Neuenahr, Droitwich, Bad Gastein, and many others derive their reputation as of great benefit to the gouty and "rheumatic" patients; Franzensbad, Luxeuil, Woodhall Spa, and Kreuznach, as stations for the treatment of the diseases of women; Wildungen, Brückenau, Contrexéville and Vittel for renal affections; Luchon and Pistyan for cutaneous diseases; Mont-Dore and Ems for respiratory difficulties; Néris and Oeynhausen for nervous debilities; Plombières for colitis; Chatel-Guyon for chronic constipation; Schwalbach for anaemia, and so on. No hard and fast line can be drawn anywhere between them.

Classification of the Medicinal Springs

It is very difficult to classify the waters accurately, either in relation to their therapeutic action, or to their chemical composition. The most common classification of the medicinal springs is based on the chemistry of the waters and recognizes six major types, with more or less numerous subdivisions under each type.

The *muriated* or *common salt waters* have sodium chloride as their principal constituent. The amount of salt varies from 2 parts per 1000, as at Baden-Baden which is below sea water concentration, to 330 parts per 1000, as at Morszyn, Poland, which is about ten times the strength of sea water. In addition, the muriated springs contain in variable quantities, sulphates of sodium and of magnesium, sodium bicarbonate, and many other minor but important admixtures, such as arsenic, lithium, stronthium, iodine, bromine, etc. The waters issue cold or hot, and very often contain variable amounts of free carbonic acid. Only the weaker salt waters can be employed internally, the stronger ones being used only as baths.

In the *alkaline* waters, sodium bicarbonate is the predominating ingredient. Some of these alkaline waters like Vichy and Neuenahr are simple. The larger number, however, contain considerable quantities of common salt as well as sodium sulphate, magnesium sulphate, salts of calcium, arsenic, and iron. These springs, likewise, are of different thermality, and frequently contain free carbon dioxide.

To the third major group belong the *sulphur* waters in which the sulphur appears in the form of sulphides and sulphurated hydrogen gas. The mineralization of these waters varies considerably, very many of them containing large quantities of common salt (the "bitter waters"); others, carbonates. The sulphur waters, as a rule, issue cold.

The *calcareous* springs are both hot and cold, and have

for their main constituents the carbonates of calcium, of sulphate, and of magnesium. They sometimes also carry free carbonic gas.

The *chalybeate* or *ferruginous* waters contain bicarbonate or protosulphate of iron in quantities sufficient to render them therapeutically active; often in combination with free carbon dioxide gas and other components.

Finally, there are the "simple" or "indifferent" *thermal* springs which are feebly mineralized, issue at temperatures varying from 60° to 120° F. and are, as a rule, radioactive.

The Theory of Balneology

The therapeutic action of the waters, when taken internally, is primarily due to their aperient, purgative, and diuretic qualities, to their tonicity in relation to the blood serum, as well as to their bactericidal and bio-chemical action of which a great deal is made by French writers. It is claimed that artificial preparations, although of the same gross chemical composition, never produce the same beneficial results as follow from the employment of natural waters. This, it is maintained, is due to the peculiar chemical "balance" of the waters as they issue from the springs. The constituent elements of the salts are partially in a state of ionic dissociation, or in a colloidal state, and it is claimed that the minerals and metals found in minute quantities may, like vitamins in food, play an important, though not as yet fully ascertained part. Mineral water, when it comes from the spring, is absolutely clear, but it undergoes a very rapid change under the influence of light and outside air, as well as exterior temperature and pressure. After a short period a white precipitate of originally dissolved material becomes visible in the water. Reliable chemical research of the last few years seems to show that "active substance of a curative water may be present in extremely small amounts, and often only slight traces of a substance suffice to bring about profound bio-

logic changes in animals and in man." . . . "Amounts of substances which are hardly weighable and perhaps only spectroscopically detectable are capable, under certain circumstances, of exerting great biologic effects and are, therefore, of therapeutic significance." . . . "It has been established that the electrolytes play a part in determining the constitution of man, and that in the coöperation of many electrolytes is to be sought one of the fundamental curative factors in the therapeutic use of mineral springs. The use of drinking cures stands preeminent in the possibility that it offers of administering to the human body sufficient quantities of electrolytes in a dissociated state and in combination with many other ions. By means of baths, too, ions such as calcium can be brought through the skin, as Wermel has recently shown."*

Perrin and Mathieu** maintain that the mineral substances dissolved in medicinal spring water furnish the (intermicellar) liquids with a variety of salts in a colloidal state which are essential to the proper nourishment of the cells. The ions and colloids of the mineral waters carry an electrical charge which neutralizes that of the electrolytes and the colloids of the (intermicellar) liquid, and which are likely to cause the flocculations of the living colloids. They play, therefore, a defensive part as well as a nutritive one. According to the nature of its chemical composition, mineral water is regarded as possessing a specific protective action on the organic cell.

The chemical phenomena which condition the cellular life produce oxidation. The mineral waters are claimed to facilitate the release of oxygen contained in the hemoglobin, thus aiding, indirectly, general nutrition. The

* From the Laboratories of the Rockefeller Institute for Medical Research, published by the *Archives of Internal Medicine*, October 1927. Baudisch and Davidson: "Natural Mineral Waters in the Light of Modern Research."

** Perrin and Mathieu, "Les Eaux Minérales," pp. 57-68, Paris, 1925. Ernest Flammarion, Editeur.

chemical reactions in the tissues are expedited by the catalyzing effect of the mineral waters. On this point the reader will find interesting observations in the report by Baudisch and Davidson of the Rockefeller Institute of Medical Research on "The Catalytic Action of Saratoga Springs."

All the theorists of balneology go into details of the physiologic action of the main chemical constituents of the mineral waters, such as sulphur, chlorides, calcium, sodium, magnesium, potassium, iron, arsenic, and many of the other elements which are frequently found there in different quantities.

Of late years, a great deal has been made of the radioactivity of the mineral waters as a therapeutic agent. Tomes have been written on the subject and tons of advertisement distributed broadcast. And yet, at one of the spas with indifferent thermal waters and considerable radio-activity, good therapeutic results were recorded for a century or so, although until comparatively recently the waters were collected in open reservoirs and kept there for many days before being used, all traces of the radium emanation having disappeared by that time. At Bad Gastein, interesting comparative experiments were made with natural and artificial radium-irradiated water. Natural radioactive water stimulates the production of hydrochloric acid in the stomach, while artificial radium water does not produce such effects. Frogs' eggs grow to twice the ordinary size in the natural radioactive water. The employment of the radioactive water accelerates sedimentation of red blood corpuscles, while the artificially radiated water fails to do so. It stimulates ovarian and testicular glands, and is claimed to be of benefit in the treatment of arterio-sclerosis, gout, arthritis deformans, Heberdeen's nodes, sciaticas, neuralgias, myalgias, renal calculus, and others. Hypertrophied prostates are improved by irrigations with radioactive water.

The Therapeutic Claims

Although in the past the reputation of the average spa physician has not always been of the highest, there has developed, particularly since the War and the ensuing economic changes in the life of many of the European nations, a somewhat different attitude on the part of medical men toward spa practice. Many very able clinicians have taken up work at the health resorts. By precept, study, observation, and their own experience, a body of knowledge has been developed relative to the application of the spa waters to a vast variety of chronic ailments. It may be said, however, that the use of the waters internally and externally, as well as the physical therapy employed, are supplementary to the basic, medical consideration of each case.

It must be recognized that the highly mineralized waters are, de facto, potent compound drugs which, when taken internally, cause profuse elimination of waste matter, either through the bowels or through the kidneys. These eliminants, when judiciously used in connection with diet, exercise or rest, as the case may call for, produce beneficent effects in very many disease conditions resulting from defects of nutrition, faulty metabolism, disorders of circulation, or disturbed neuro-psychic balance. The sulphated waters, both alkaline and muriated, act on the liver and are of proven benefit in many kinds of hepatic derangement, and even in cholelithiasis.

The pharmacology of the mineral waters in their almost infinite variety and degrees of strength, has received a great deal of honest study, and so has the physiologic effect of these waters when employed in the form of baths, as well as in sprays and douches. The results of the various kinds of diaphoretic, gaseous, saline, brine, sulphur, peat or mud baths are attributed to "the excitation of changes in the circulation, general and local, leading to improved blood and lymph supply to the tissues, and accelerated interchange of tissue fluid; the raising of the resistance of

the body to infection by the production of bactericidal substances in the blood, and the flooding of local parts with fresh blood and lymph charged with antibodies; and the effects, sedative or stimulant, of temperature, percussion, massage and the like on the nervous system." (See *Lancet*, June 1, 1929. Lecture by Wilfrid Edgecombe, M.D.)

Gaseous and saline baths promote cutaneous excretion and improve the peripheral and general circulation by dilating the superficial capillaries, thus lowering vascular tension. In view of the evident importance of carbonated water baths, and particularly in relation to Saratoga Springs, the reader is referred to a statement on the effect of effervescent baths, as presented by Dr. R. Fortescue Fox in his book on "The Principles and Practice of Medical Hydrology," published by the University of London Press, London, 1913. This statement is reprinted in full in the appendix to this report. (Appendix No. 1).

Without a multiplicity of carefully planned laboratory research experiments and many control series of patients, it is obviously impossible to arrive at a scientific and precise determination of the effect of the waters as therapeutic agents. Hitherto, no important study of this character has ever been made. The so-called scientific evidence is based on sketchy or inconclusive experiments, made rather hurriedly, or on incomplete clinical data. At no spa has any serious attempt been made to organize systematic, scientific research. It is only recently that a scientific institute was established at Nauheim, and its scope enlarged, thanks to the generosity of an American patient who thus expressed the gratitude felt for the benefits derived from the treatment there. The spa physicians have a rather short season and it is hardly to be expected that they would keep records of patients in a way which would make them valuable for serious scientific reference. The records are sketchy, as a rule, and contain the minimum amount of information required for ordinary practical purposes. A large part of the balneological literature must needs be

inconclusive at best; here and there one may find a minor contribution of scientific value. The remainder may possibly be of service as a record of clinical observation, and of the results of empirical experience.

The members of the Committee attempted to procure evidence from the available literature and from the leading balneologists interviewed. The replies to a series of questions submitted to Dr. Groedel at Nauheim which he kindly made, are the best testimony which was received. This will be found in the Appendix to the Report. (Appendix No. 2.)

Recapitulation

It will be seen from the above that spa treatment comprises much more than mineral water treatment. It is organized around the mineral waters, to be sure, but the waters constitute only a part of the regimen. At the spas every patient is under medical care—in very many instances under very competent medical care. He gets, in addition, all that the natural and artificial environment contributes to the amelioration of his condition somatically and mentally, and his diet, exercise, rest, and physical therapy are prescribed for him in minute detail. To evaluate the importance of any one element in the treatment is impossible except under ideal conditions where control experiments could be carried on for a considerable period of time with adequate follow up.

The clinical testimony is enormous in bulk. The major part of it can be easily discarded as of no scientific value. There are contributions, however, which have been made by the more modern type of physician who has taken up the work of the spas, and whose testimony cannot entirely be brushed aside. Many of them have fortified their observations by laboratory tests and by experimentation on animals. There does not exist any evidence based on control experiments. While there is no doubt that carbonated baths like those of Nauheim or Royat lower hypertension

at least temporarily, and that the use of waters like those of Contrexéville, Karlsbad, and others produces changes in metabolism as evidenced by the chemical composition of the blood and the urinary output, the claim that CO_2 gas is absorbed through the skin and that this absorption has an effect similar to that of digitalis, is hardly convincing. Statements are often made for which no adequate proof has been adduced, and which evidently are not relied upon entirely by the spa physicians, themselves, for at Nauheim and elsewhere ordinary therapy is employed in addition to the carbonated baths. Traditionally and empirically, the waters at the spas are utilized as a part of the general plan of treatment and with, no doubt, beneficial results.

Aside from the fact that the imbibition of mineral waters results in purging the body of effete matters and in the stimulation of metabolism, little of a definite character has been established concerning their physiological, chemical and bio-chemical effects. An opportunity for "prospecting" lies open in a field of seemingly important resources whose surface only has been scratched by the tools of science.

Accommodations and Charges

The spas endeavor to provide facilities for all classes of patients. Just as there are hotels and boarding houses of different grades of comfort, so the bathing and physiotherapy establishments differ in appointment from the luxurious to the very modest. Patients patronizing the spas come from all strata of society—from crowned heads to workingmen who are sent there as beneficiaries of the sickness insurance funds. In many of the resorts the benevolent insurance funds maintain their own homes, and at some of the spas, charitable associations have established institutions for the poor, particularly for sick children.

In the Class "A" bathing establishments, there are the super-luxe compartments with private salons for rest.

There are also, of course, the less luxurious rooms. The cheaper establishments are equipped with modest bathing facilities and with rest bunks in large wards. Everywhere it has been pointed out that the fundamental services are alike, the differences being only in equipment and trappings. In all of the establishments the baths and treatments are given on a very strict appointment basis. As the demand for treatment is greater in the morning than in the afternoon, the prices are accordingly higher for morning than afternoon treatments, in every class of accommodation.

The charges for the baths and treatments vary from place to place. The more fashionable resorts are somewhat more expensive than the less renowned ones. In addition to the established rates there are additional charges for supplementary services, for linen, attendants, and so on. It is difficult to arrange the charges in tabular form for comparative purposes, because the ranges are wide and the items too numerous. For purposes of illustration, the prevailing scale of charges at Bath, England; Vichy, France; Kissingen, Germany; and Karlsbad, Czechoslovakia, are reproduced in the appendix as typical of charges in the European spas. (See Appendix No. 3). On the average, the daily cost for first class treatments (not de luxe), with no inordinate amount of physiotherapy, amounts to between $3.00 and $5.00 in American money. For the cheapest type of treatments, it probably averages around $1.50 per day.

At most of the spas there are Institutes of Physiotherapy where all known mechanical contrivances are to be found, as well as all the modalities of electrotherapy. These Institutes, as a rule, are very frequently rented out to physicians who are responsible for their management and operation. In some of the spas, the Institutes are the property of the company, or the municipality, as the case may be, and the physicians in charge are employed on a salary basis. Hydro-therapeutic equipment, as well as facilities for colonic irrigations and vaginal douches are

usually provided in the bathing establishments. In some places, notably Karlsbad and Franzensbad, dry gas baths are given. In other places facilities for open air sun baths are provided on the roofs of the buildings. In some of the spas there are inhalatoria, the one most interesting being the Gradier Bau at Kissingen. This is a very tall structure of white thornwood, over which the saline waters are continually played, creating a fine spray. Around this structure are terraces with steamer chairs which are hired by the day or week, and in which the patients repose, inhaling the aromatic, moist air. In very many places there are facilities for throat gargling with especially suitable waters.

The drinking halls are usually very imposing in size, affording ample opportunity for the patients to sit around or walk while sipping the waters. There are also protected promenades, and in the morning and afternoon at the customary drinking hours, there is music. It is here that tout le monde meets and it affords an opportunity for the display of gowns, and for talks about the events of the day and changes in symptomatology.

Every spa is provided with a clinical laboratory and an X-ray laboratory. These often belong to individual physicians, sometimes again to the concessionaire companies. The most ideal relationship of the laboratories to the practicing physicians, exists at Contrexéville where the director of the establishment is a man of recognized eminence, a professor of surgery at one of the universities, who is on a salary, and stands in a consulting relationship to the practitioners. The charges for laboratory and X-ray work at the spas correspond to the charges for similar work prevailing in the country in which the spa is located.

In many of the spas, the practicing physicians adopt a scale of compensation for their services. In some this scale is lower for nationals of the "poorer" countries, and higher for those of "rich" countries. Although one hears occasionally of exorbitant charges, on the whole the rates

charged are very reasonable. In many of the resorts, physicians maintain sanatoria where competent care is given to the sick and control exercised over their mode of life and medication. Some of these sanatoria are of a serious medical character; others are operated in ways to impress the patient with the multiplicity of apparatus and treatment procedures, and for making as much as "the traffic will bear."

With the exception of Harrogate, at all the spas a cure tax is levied on persons staying longer than a couple of days. This tax is collected by the hotels or boarding houses and it varies in accordance with the type of hotel accommodations. The economic status of the sojourner is thus gauged. Physicians and their families are exempt from the taxes, and at some of the resorts certain other occupations, such as teachers or government employees, pay reduced taxes. In some of the resorts the tax amounts to as much as $10 per head. The money usually goes toward the upkeep of the resort, improvements, amusements, orchestras, maintenance of roads, parks, benches, and so on. A part of it, no doubt, is assigned to promotional expenses. These must be quite heavy, judging by the amount of so-called literature that is freely distributed. Some of it is misleading and no doubt does harm in many instances by the exaggeration of the effectiveness of the cure. Many very sick patients and many of those who can ill afford travel and residence at a distant resort, are lured hither by the advertisements, direct and indirect. Just like in one of the text-books on American Spas, there are pictures of hotels which are really but architectural projects, so in the advertisements distributed on the steamships, there are pictures of opera houses at some of the resorts where there are no such, or even inferior, luxuries to be found.

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Zemsky, J. L. An outline of oral surgery for the general dental practitioner.
Brooklyn, Physicians & Surgeons Book Co., 1930, 171 p.

CORRECTION

In the following letter Dr. Carlisle has called attention to an error which appeared in the Bulletin (2nd Series, Vol. VI, No. 7, page 500, line 25.)

July 28, 1930

"The account of the Dinner given in honor of Doctor Welch which is published in the Bulletin for July is a full and very interesting one of a delightful and memorable occasion.

"There is in it, however, a serious error in the report of Doctor Welch's remarks which I must ask you to endeavor to correct, please. On page 500, at the end of the first paragraph, credit is given to me that rightly belongs to Dr. Walter Lester Carr; they were Doctor Carr's slides that Professor Welch spoke of,—not mine. We sat at the same table and Doctor Welch happened to mention my name first and no doubt due to the similarity of sound, the stenographer made the error.

"The compliment Doctor Welch paid to Walter Lester Carr was well-deserved and should go to him and not to me.

"Will it be possible to make a note of this in some way?

Robert J. Carlisle."

DEATHS OF FELLOWS OF THE ACADEMY

Walter M. Brickner, M.D., 151 Central Park West, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1896; elected a Fellow of the Academy February 2, 1905; died, July 22, 1930. Dr. Brickner was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the Society of Associated Alumni of Mt. Sinai Hospital, a member of the Society of Alumni of Sloane Hospital for Women, Associate Surgeon to Mt. Sinai Hospital and Surgeon to the Morrisania Hospital and the Hospital for Joint Diseases.

Condict Walker Cutler, M.D., 667 Madison Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1882; elected a Fellow of the Academy April 7, 1892; died, July 9, 1930. Dr. Cutler was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the Society of Alumni of Bellevue Hospital and Consulting Physician to the New York Dispensary.

Walter Eyre Lambert, M.D., 112 East 35 Street, New York City; graduated in medicine from the Royal College of Physicians and Surgeons of Edinburgh, in 1884; elected a Fellow of the Academy June 3, 1897; died, July 28. 1930. Dr. Lambert was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the American Ophthalmological Society and Consulting Surgeon to the New York Eye and Ear Infirmary.